

**THAT WHICH IS CLAIMED IS:**

1. A wireless local area network system comprising:

5 a plurality of access point stations that receive and transmit communication signals within a wireless local area network;

a mobile station in communication with a plurality of access point stations;

10 a processor operatively connected to each of the access point stations and operative for processing communication signals received from the mobile station and determining which communication signals are first-to-arrive signals and conducting differentiation of the first-to-arrive signals to locate a mobile station and weighting delayed versions of at least one interference signal by controlling amplitude and phase with weighted functions  $W_1$ ,  $W_2$  ...  $W_n$  and summing any resultant weighted replicas to determine an approximation of the dispersed interference for cancelling interference.

2. A wireless local area network system according to Claim 1, and further comprising an interference detector and controller circuit that provide a control loop for minimizing interference.

3. A wireless local area network system according to Claim 1, and further comprising a system antenna and an interference receiving antenna directed for receiving an interference signal.

4. A wireless local area network system according to Claim 3, and further comprising two system antennas spaced in diversity.

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5. A wireless local area network system according to Claim 1, and further comprising a processor positioned at each access point station for determining first-to-arrive signals and a location 5 processor that receives any determined first-to-arrive signals from each access point station and conducts differentiation of said first-to-arrive signals.

6. A wireless local area network according to Claim 1, wherein said mobile station comprises a mobile access point station that receives and transmits communication signals within the wireless local area 5 network.

7. A wireless local area network according to Claim 1, wherein said mobile station comprises a mobile device in communication with an access point station.

8. A wireless local area network according to Claim 7, wherein said mobile device comprises a tag transmitter associated with an object.

9. A wireless local area network according to Claim 1, wherein a processor is operative for determining first-to-arrive signals based on a common timing signal.

10. A wireless local area network system comprising:

a plurality of access point stations that receive and transmit communication signals within the 5 wireless local area network, said access point stations further comprising a system antenna and an interference

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receiving antenna directed for receiving an interference signal;

10 a mobile station in communication with a plurality of access point stations;

15 a processor operatively connected to each access point station for processing communication signals received from the mobile station and determining which communication signals are first-to-arrive signals and conducting differentiation of first-to-arrive signals to locate a mobile station;

20 a tapped delay line, summer, controller, and interference detector circuit operatively connected to said system and interference receiving antenna for weighting delayed versions of at least one interference signal by controlling amplitude and phase with weighting functions  $W_1, W_2 \dots W_n$  and summing any resultant weighted replicas to determine an approximation of the dispersed interference for 25 cancelling interference.

11. A wireless local area network system according to Claim 10, and further comprising two system antennas spaced in diversity.

12. A wireless local area network system according to Claim 10, and further comprising a processor positioned at each access point station for determining first-to-arrive signals and a processor 5 that receives any determined first-to-arrive signals from each access point station and conducting differentiation of said first-to-arrive signals.

13. A wireless local area network according to Claim 10, wherein said mobile station comprises a mobile access point station that receives and transmits

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communication signals within the wireless local area  
5 network.

14. A wireless local area network according to Claim 10, wherein said mobile station comprises a mobile device in communication with an access point station.

15. A wireless local area network according to Claim 14, wherein said mobile device comprises a tag transmitter associated with an object.

16. A wireless local area network according to Claim 10, wherein a processor is operative for determining first-to-arrive signals based on a common timing signal.

17. A location system for locating objects within a monitored environment comprising:

a tag transmitter associated with each object within the monitored environment and operative to

5 transmit a signal encoded with information representative of the identification of the object;

a plurality of spaced monitoring receivers for receiving signals from tag transmitters; and

10 a processor operative with each of said monitoring receivers for receiving and processing signals received from tag transmitters for determining which signals are first-to-arrive signals and conducting differentiation of the first-to-arrive signals to locate an object and associated tag and  
15 weighting delayed versions of at least one interference signal by controlling amplitude and phase with weighting functions  $W_1, W_2 \dots W_n$  and summing any resultant weighted replicas to determine an

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approximation of the dispersed interference for  
20 cancelling interference.

18. A location system according to Claim 17,  
wherein a processor is operative for determining which  
signals are first-to-arrive signals based on a common  
timing signal.

19. A location system according to Claim 17,  
and further comprising an interference detector and  
controller circuit that provide a control loop for  
minimizing interference.

20. A location system according to Claim 17,  
and further comprising a system antenna and an  
interference receiving antenna directed for receiving  
an interference signal.

21. A location system according to Claim 20,  
and further comprising two system antennas spaced in  
diversity.

22. A location system according to Claim 17,  
and further comprising a processor positioned at each  
monitoring receiver for determining first-to-arrive  
signals and a location processor that receives any  
5 determined first-to-arrive signals from each monitoring  
receiver and conducting differentiation of said first-  
to-arrive signals.

23. A location system for locating objects  
within a monitored environment comprising:

a tag transmitter associated with each object  
within the monitored environment and operative to

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transmit a signal encoded with information representative of the identification of the object;  
a plurality of spaced monitoring receivers for receiving signals from tag transmitters and each  
5 including a system antenna and interference receiving antenna;

a processor operative with each of said spaced monitoring receivers for receiving and processing signals received from tag transmitters for  
10 determining which signals are first-to-arrive signals and conducting differentiation of the first-to-arrive signals to locate an object and associated tag; and  
a tapped delay line, summer, controller and interference detector circuit operatively connected to  
15 said system antenna and interference receiving antenna for weighting delayed versions of at least one interference signal by controlling amplitude and phase with weighting functions  $W_1$ ,  $W_2$  ...  $W_n$  and summing any resultant weighted replicas to determine an  
20 approximation of the dispersed interference for cancelling interference.

24. A location system according to Claim 23, wherein a processor is operative for determining which signals are first-to-arrive signals based on a common timing signal.

25. A location system according to Claim 23, and further comprising two system antennas spaced in diversity.

26. A location system according to Claim 23, and further comprising a processor positioned at each monitoring receiver for determining first-to-arrive signals and a location processor that receives any

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determined first-to-arrive signals from each access point station and conducting differentiation of said first-to-arrive signals.

27. A wireless local area network system comprising:

a plurality of access point stations that receive and transmit communication signals within a 5 wireless local area network;

a processor operatively connected to each of the access point stations and operative for processing communication signals received from a mobile station in communication therewith and weighting delayed versions 10 of at least one interference signal by controlling amplitude and phase with weighted functions  $W_1$ ,  $W_2$  ...  $W_n$  and summing any resultant weighted replicas to determine an approximation of the dispersed interference for cancelling interference.

28. A wireless local area network system according to Claim 27, and further comprising an interference detector and controller circuit that provide a control loop for minimizing the total amount 5 of interference.

29. A wireless local area network system according to Claim 27, and further comprising a system antenna and an interference receiving antenna directed for receiving an interference signal.

30. A wireless local area network system according to Claim 29, and further comprising two system antennas spaced in diversity.

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31. A wireless local area network according to Claim 27, wherein said mobile station comprises a mobile access point station that receives and transmits communication signals within the wireless local area  
5 network.

32. A wireless local area network according to Claim 27, wherein said mobile station comprises a mobile device in communication with an access point station.

33. A wireless local area network according to Claim 27, wherein said mobile device comprises a tag transmitter associated with an object.

34. A wireless local area network system comprising:

5 a plurality of access point stations that receive and transmit communication signals within the wireless local area network from a mobile station in communication therewith;

said access point stations further comprising a system antenna and an interference receiving antenna directed for receiving an interference signal;

10 a tapped delay line, summer, controller and interference detector circuit operatively connected to said system and interference receiving antenna for weighting delayed versions of at least one interference signal by controlling amplitude and phase with  
15 weighting functions  $W_1, W_2 \dots W_n$  and summing any resultant weighted replicas to determine an approximation of the dispersed interference for cancelling interference.

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35. A wireless local area network system according to Claim 34, and further comprising two system antennas spaced in diversity.